

DURHAM'S WATER SYSTEM

DELIVERED AN AVERAGE OF

31.95 MILLION GALLONS

OF WATER PER DAY TO

APPROXIMATELY 170,000

PEOPLE IN DURHAM

DURING 2000.

## Conservation

The City's conservation staff offers the following tips to reduce stress on the City's water system while lowering your water bills in the process:

- Water your lawn only when it needs it, and only before 10 a.m. or after 6 p.m. One inch of water per week is sufficient to keep your lawn and plants healthy. Use a rain gauge to track rainfall and factor that in the amount of water to apply to you lawn.
- Make sure that sprinklers are watering only the landscape, not the driveway and street. When cleaning the drive and walkways, use a broom or leaf blower.
- Plant drought-tolerant and/or native trees and plants. These plants, once established, will survive and even thrive for long periods without rain.
   Use mulch to help retain moisture.

# welcome

Are you interested in how decisions are made regarding the operation, maintenance, expansion or upgrade of Environmental Resources Department facilities or other City departments? Citizens are welcome to attend regular City Council meetings. The schedule is as follows:

PUBLIC WORKS
2nd and 4th Monday at 3 p.m.

FINANCE
2nd and 4th Thursday at 3 p.m.

COMMITTEE OF THE WHOLE
Thursdays preceding the
1st & 3rd Mondays at 8:30 p.m.

CITY COUNCIL

1st and 3rd Monday at 7:00 p.m.

All meetings are at City Hall (101 City Hall Plaza)
in either the Council Chambers (first floor)
or Committee Room (second floor).

### EN ESPAÑOL

Este folleto tiene informacion importante acerca de la calidad del agua provee la Ciudad de Durham.

Si necessita mayor informacion acerca del contenido de este folleto el personal del Centro Hispano, 261 West Main Street, Suite 100, telephono, (919) 687-4635 puede ayudario.

## **Tip-Top Tap Water**

Each time you use water from your tap, you tap into quality. As a City of Durham water customer, you'll be proud to know that during the year 2000, Durham's tap water had zero violations of any standards, state or federal. In fact, that's the standard of excellence the City of Durham Environmental Resources Department has maintained for the past several decades.

In this fourth edition of Tap into Quality, you'll find information about the sources of Durham's drinking water, the current treatment process, upcoming changes in treatment processes, special populations and conservation tips, as well as analytical results.

Questions regarding this report should be directed to City of Durham Environmental Resources staff at the Brown Water Treatment Plant, (919) 560-4362. For information on water conservation, public education programs or to arrange a tour of facilities, call (919) 560-4381. Call (919) 560-4411 for all billing questions.

## **Sources of Durham's Drinking Water**

The sources of drinking water (both tap and bottled) are surface water, such as rivers, lakes, streams, ponds, reservoirs and ground water, such as springs, and wells. Durham is fortunate to have two high quality sources of surface water—Lake Michie (Lake Michie Dam Road) and Little River Reservoir (1701 Snow Hill Road). Lake Michie has provided Durham with approximately 22 million gallons of water per day (MGD) since 1926. Little River Reservoir and Dam, constructed in 1988, provides an additional 21 million gallons of water per day.

## **How Water Travels**

As water travels over the surface of the land and through the ground, minerals and other materials are dissolved naturally. Water can pick up substances that are the result of animal or human activity. Source water may contain microbial contaminants such as viruses and bacteria; inorganic contaminants such as salts and metals; pesticides and herbicides from agriculture or urban runoff; organic chemicals from industrial process or run-off; and radioactive contaminants, which can be naturally-occurring.

## What to Expect of Drinking Water

It is reasonable for customers and consumers to expect at least small amounts of some contaminants to be present in drinking water – both bottled and tap. The presence of these contaminants does not necessarily indicate that the water poses a health risk. To receive more information about contaminants and potential health effects, call the EPA's Safe Drinking Water Hotline at 800-426-4791.

## What's New?

#### CITY TO USE DIFFERENT DISINFECTANT

Over the next year, the City of Durham will be preparing to use an alternative form of disinfection to kill potentially harmful bacteria in water. By early 2002, the water you drink will be disinfected with chloramines —a combination of chlorine and ammonia—rather than the chlorine used now.

Why the change? While this change allows the City to meet more stringent testing guidelines, its immediate impact will be to lower the levels of Total Trihalomethanes (TTHMs) in the distribution system. It also helps the City comply with new regulations in 2002 to reduce the amount of Haloacetic Acids (HAA). Both TTHMs and HAAs are by-products formed by the chlorination process and have undergone testing by the Environmental Protection Agency as suspected carcinogens for people. The City of Durham's drinking water has consistently tested below the current standards for TTHMs and the conversion to chloramines will allow the City's water to meet new, more stringent standards in the future.

Who does this change affect? Two groups of people that need to take special care with chloraminated water are kidney dialysis patients and fish owners. Chloramines must be removed from the water used in the kidney dialysis process and from water used in fish tanks and ponds. Kidney dialysis centers will have to make modifications to their purifying process and home dialysis patients should consult their physicians. Fish owners should contact their local pet store for more information. The City will contact members of these groups well in advance of the changeover. The changeover process will also be publicized in a number of media outlets to help ensure that customers are informed of the change.

Do other cities use chloramines? Yes, both Raleigh and Cary use chloramines for disinfection purposes. Chapel Hill, Carrboro and Hillsborough plan to convert their systems to chloramines during the same time as the City of Durham (early 2002).

Will my tap water taste different? You may notice very slight differences in the taste and odor of your tap water. However, the change will not have any effect on the quality or safety of your drinking water.

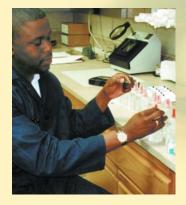
#### PILOT PLANT HELPS ENSURE WATER QUALITY

In April 2000, the City of Durham constructed a pilot plant, a working small-scale facility that models plant processes and treatment trains. Testing conducted at the pilot plant allows water treatment staff to evaluate alternative processes to improve water quality and/or reduce treatment costs. Once the alternative processes have been demonstrated successfully in the pilot plant, the processes can then be implemented in the City's treatment plants. The pilot plant is located on the grounds of the Brown Water Treatment Plant at 1615 Infinity Road.





The federal Safe Drinking
Water Act Amendments
(1996) require water utilities
to annually provide
information to their
customers/consumers that
will enable them to make
informed choices and to
interest them in efforts to
improve water quality.



City chemists and lab analysts process thousands of samples each year to make sure Durham's water meets state and federal quidelines.

# How Durham's Water Measured Up

The City is required to test for over 100 different substances in the water it provides to customers. The Environmental Protection Agency (EPA) sets regulations that limit the amount of certain contaminants in the water that is provided by public water systems. The Food and Drug Administration (FDA) establishes limits for contaminants in bottled water, which must provide the same protection for public health. The table below summarizes analyses performed between January 1, 2000 and December 31, 2000 on Durham's system, PWS ID # 0332010, and shows that Durham's water had no violations of any standards during 2000.

Special Concerns and Vulnerable Populations: Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons including cancer patients undergoing chemotherapy, organ transplant recipients, people with HIV/AIDS or other immune system disorders, the elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

Cryptosporidium: This microscopic organism is a relatively new concern for water providers. When ingested, Cryptosporidium or "Crypto" can cause fever, diarrhea, and other gastrointestinal symptoms. Crypto occurs naturally in rivers and lakes and comes from animal wastes. Controlling and minimizing development and animal activities in our watershed reduces the occurrence of Crypto in raw water. The treatment combination of filtration, sedimentation and disinfection effectively eliminates Crypto from the drinking water. As part of the Information Collection Rule, Durham has monitored both supply lakes on a monthly basis since July of 1997. Crypto has never been detected in Durham's treated drinking water.

EPA/CDC (Center for Disease Control) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial organisms are available from the Safe Drinking Water Hotline, 800-246-4791.



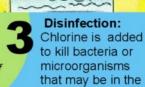


Coagulation: Alum and other chemicals are added to water to form tiny particles called "floc" which attract dirt particles.

Sedimentation:
"Floc" particles settle

to the bottom while clear water goes to filtration.

This shows a simple example of Durham 's drinking water treatment process. Other cities or utilities may use a different method of treatment and disinfection.



water.

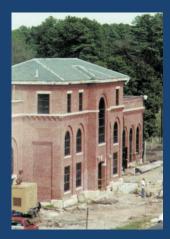


Filtration: The water passes through filters that remove smaller particles.

Storage & Distribution:
Water is stored in large
tanks or towers then flows
through pipes to you

when you open your tap.





Durham's water is treated at the Williams Water
Treatment Plant (1405
Hillandale Road) and the
Brown Water Treatment
(1615 Infinity Road), which
operate 7 days a week, 24
hours a day. The Williams
Treatment Plant is currently
being restored to its original
architectural appearance—
a natural brick façade and
arched windows.

## **EPA To Set New Arsenic Standard in Drinking Water**

Arsenic is a naturally occurring element found in rocks, soil, water, air, plants, and animals. Most arsenic enters water supplies from natural deposits; it is the 20th most common element in the Earth's crust.

The U.S. Environmental Protection Agency (EPA) will publish a new standard for arsenic in drinking water in 2003. The new standard, currently under evaluation, may limit the amount of arsenic in drinking water at 10 parts per billion (ppb), which is the same as 10 micrograms per liter. In order to understand how much this is, you can think of 10 ppb as equivalent to one penny in ten million dollars or about one minute in 2000 years. The previous standard of 50 ppb was originally based on a Public Health Service standard established in 1942 and set by EPA in 1975.

### Why will EPA issue a new arsenic standard?

EPA feels this revision will provide additional protection for 13 million Americans against cancer and other health problems.

#### How will EPA's new rule affect the City of Durham's tap water?

The City of Durham has been monitoring for arsenic in our drinking water for more than 15 years. Arsenic has NEVER been detected in the City's drinking water (the minimum detection level is 5 micrograms per liter). Arsenic is much more likely to occur in groundwater than surface water. Durham is fortunate to have two surface water supply lakes. Lake Michie and Little River Reservoir.

Substance & Unit of Measurement	Max. Level I Detected and Range	Max. Level Allowed MCL	Ideal Goal (MCLG)	Potential Source(s) of Substance	Reason(s) for Regulating Substance			
REGULATED AT THE TREATMENT PLANTS								
<b>Fluoride</b> mg/L	1.10 (< 0.75 - 1.10)	4.0	4.0	Naturally occurring mineral; also added to promote dental health	Some people who drink water containing fluoride in excess of the MCL over many years may get bone disease. Children may get mottled teeth.			
<b>Nitrate</b> mg/L (as Nitrogen)	<b>0.40</b> (< 0.10 - 0.40)	10.0	10.0	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.			
<b>Turbidity</b> NTU	<b>0.10</b> (0.05 - 0.10)	TT	N/A	Soil runoff	Turbidity has no health effects; however, turbidity can interfere with disinfection and provide a medium for microbial growth Turbidity may indicate the presence of disease-causing organisms.			
<b>Alpha emitters</b> pCi/L*	0.54 no range	15	0	Emission of alpha radiation as a result of the erosion of natural deposits	Some people who drink water with alpha emitters in excess of the MCL over many years may have an increased risk of cancer.			
Beta/photon emitters pCi/L*	2.80 no range	50**	0	Emission of photons and beta radiation as a result of the decay of natural and man-made deposits	Some people who drink water with beta/photon emitters in excess of the MCL over many years may have an increased risk of cancer.			
REGULATED AT THE CUST	EGULATED AT THE CUSTOMER'S TAP							
<b>Copper</b> mg/L ***	0.12 (90th percentile)	AL=1.3	1.3	Corrosion of household plumbing systems None of the targeted 100 sampling sites exceeded the Action Level	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Long term exposure can cause liver or kidney damage.			
<b>Lead</b> μg/L ***	ND < 5 (90th percentile)	AL=15	0	Corrosion of household plumbing systems 1 out of 100 targeted sampling sites exceeded the Action Level	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Adults who drink this water over many years could develop kidney problems or high blood pressure.			
REGULATED IN THE DISTR	REGULATED IN THE DISTRIBUTION SYSTEM							
<b>Total Coliform Bacteria</b> (as a percent)	0	< 5% positive	0	Human and animal fecal waste; indigenous sources such as vegetation; bacterial regrowth	Coliforms are used as an indicator that other, potentially-harmful bacteria may be present.			
<b>Total Trihalomethanes</b> μg/L (TTHM)	79.7 System average (41.8 - 156.1)	100	0	By-product of drinking water disinfection	Some people who drink water with TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of cancer.			
UNREGULATED SUBSTANC	CES							
Chlorodibromomethane µg/L	<b>2.8</b> (< 0.5 – 2.8)	NR	NR	Component of TTHMs	Note			
<b>Chloroform</b> μg/L	<b>108.6</b> (41.5 – 108.6)	NR	NR	Component of TTHMs	NOTE:  See above for regulating TTHMs above in the			
<b>Bromodichloromethane</b> μg/L	<b>16.3</b> (5.3 – 16.3)	NR	NR	Component of TTHMs	Total Trihalomethanes section.			

Substance & Unit of Measurement	Max. Level Detected and Range	Max. Level Allowed MCL	Ideal Goal (MCLG)	Potential Source(s) of Substance	Reason(s) for Regulating Substance		
UNREGULATED SUBSTANCE	UNREGULATED SUBSTANCES (cont.)						
<b>Haloacetic Acids</b> μg/L (HAAs)	70.2 System average (37.6 – 96.0)	NR [60 effective 01/01/02]	N/A	By-product of drinking water disinfection	Some people who drink water containing HAAs in excess of the MCL over many years may have an increased risk of cancer.		
<b>Sodium</b> mg/L	<b>20.4</b> (5.2 – 20.4)	NR	20 [Proposed]	Naturally occurring element in soil and water	Sodium is an essential nutrient; however, consuming high levels of sodium can contribute to high blood pressure.		
<b>Sulfate</b> mg/L	<b>28</b> (18 - 28)	NR	500 [Proposed]	Naturally occurring mineral in soil	Sulfate may have a laxative effect for some people who drink water containing high levels of sulfate		
Total Organic Carbon mg/l Results show the range of TOC in both source and treated water. Durham's treatment processes remove significantly more than the required 45%.	Source 6.7 (4.3-6.7) Treated 2.5 (1.7-2.5) Avg. removal 58%	NR	TT 45% removal	Naturally present in the environment	Total organic carbon (TOC) has no health effects; however, TOC provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of cancer.		

\*Samples were collected and analyzed July 2000. \*\*EPA considers 50 pCi/L to be the level of concern for beta particles.
\*\*\* Sampling and analysis conducted every three years. Next sampling due Sept 2001.

### **KEY TO ABBREVIATIONS IN TABLE**

mg/L	Milligram per liter, or parts per million.
MCL	Maximum Contaminant Level; the highest level of a
	contaminant that is allowed in drinking water.
MCLG	Maximum Contaminant Level Goal; the level of a
	contaminant in drinking water below which there is no
	known or expected risk to health.
AL	Action Level; the concentration of a contaminant that
	triggers treatment or other requirements that a water
	system must follow. Action Levels are reported at the
	90th percentile for homes at greatest risk.
TT	Treatment Technique; a required process intended to
	reduce the level of a contaminant in drinking water
μg/L	Micrograms per liter, or parts per billion
PCi/L	Picocuries per liter is a measure of the radioactivity in water.
NTU	Nephelometic Turbidity Units; measures the cloudiness in water
ND	Not Detected
NR	Not Regulated
<	Less Than
N/A	Not Applicable

### PHYSICAL AND MINERAL CHARACTERISTICS

SUBSTANCE, UNIT OF MEASUREMENT	ANNUAL AVERAGE
pH, standard units - range	6.9 – 7.3
Alkalinity, mg/L	24
Aluminum, mg/L	< 0.05
Calcium, mg/L	13.4
Chloride, mg/L	9.8
Conductivity, micro ohms/cm	138
Hardness - Calculated, mg/L	41
Hardness - EDTA, mg/L	42
Orthophosphate, mg/L (as phosphorus)	0.29
Potassium, mg/L	1.6
Total Solids, mg/L	86
Zinc, mg/L	0.33